L. N. D. WILLIAMS.

HOSIERY.

APPLICATION FILED JUNE 10, 1915.

1,270,083.

Patented June 18, 1918.

4 SHEETS—SHEET 1.

Fig. 1.

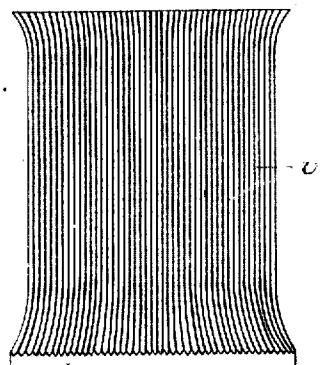
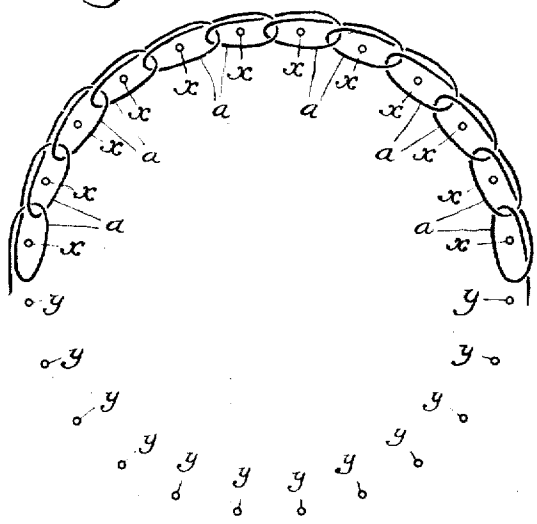


Fig. 3.



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4 SHEETS—SHEET 2.

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Fig. 2.

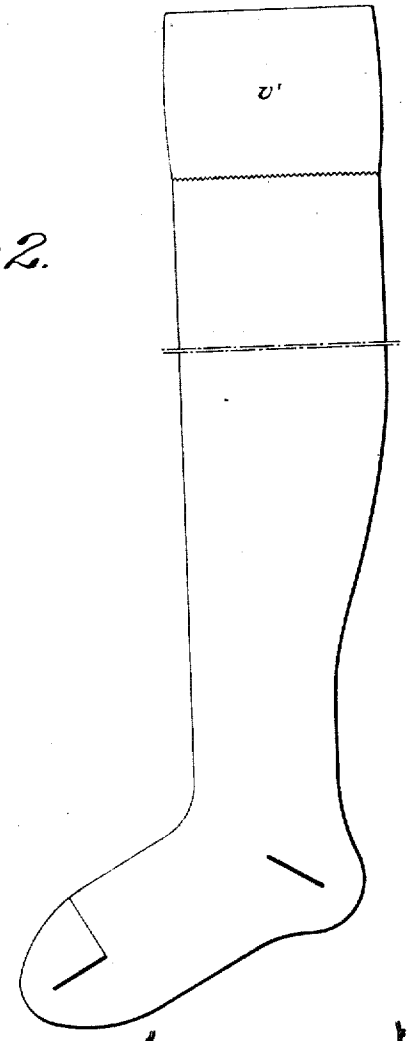
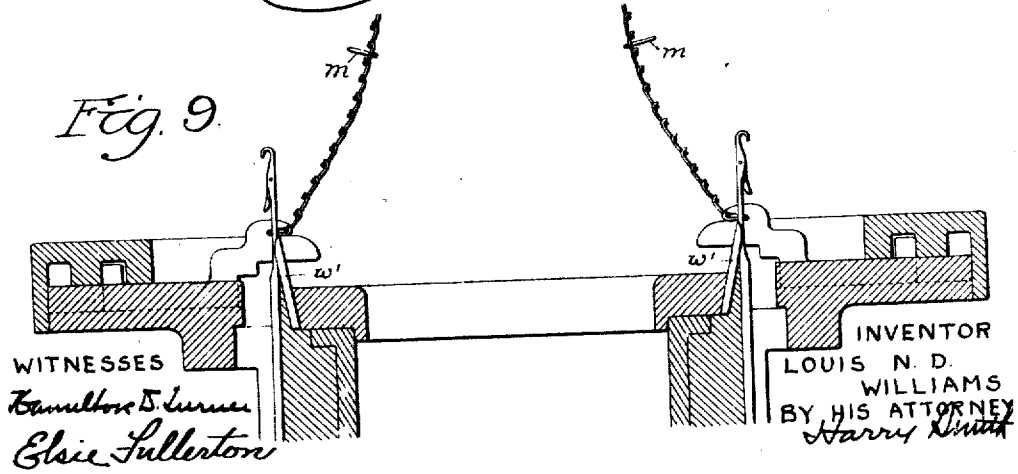


Fig. 9.



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4 SHEETS—SHEET 3.

Fig. 4.

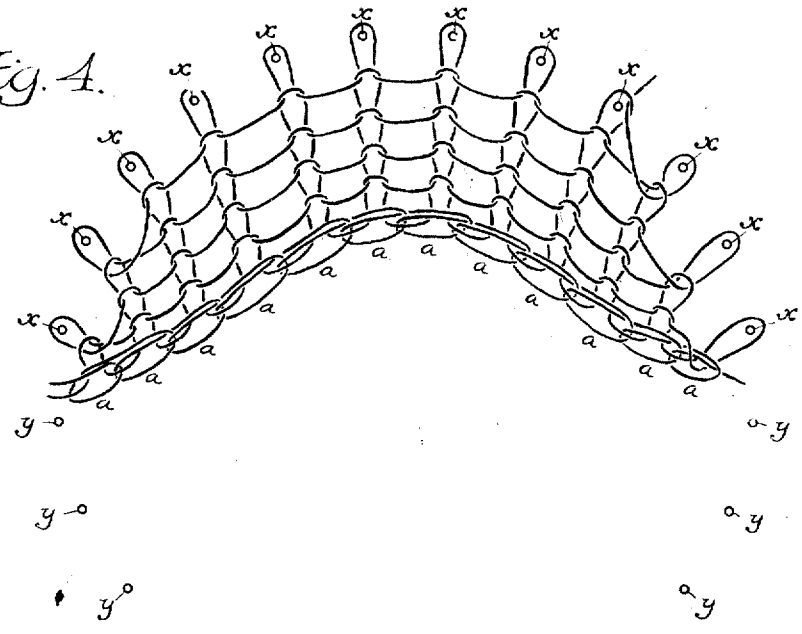
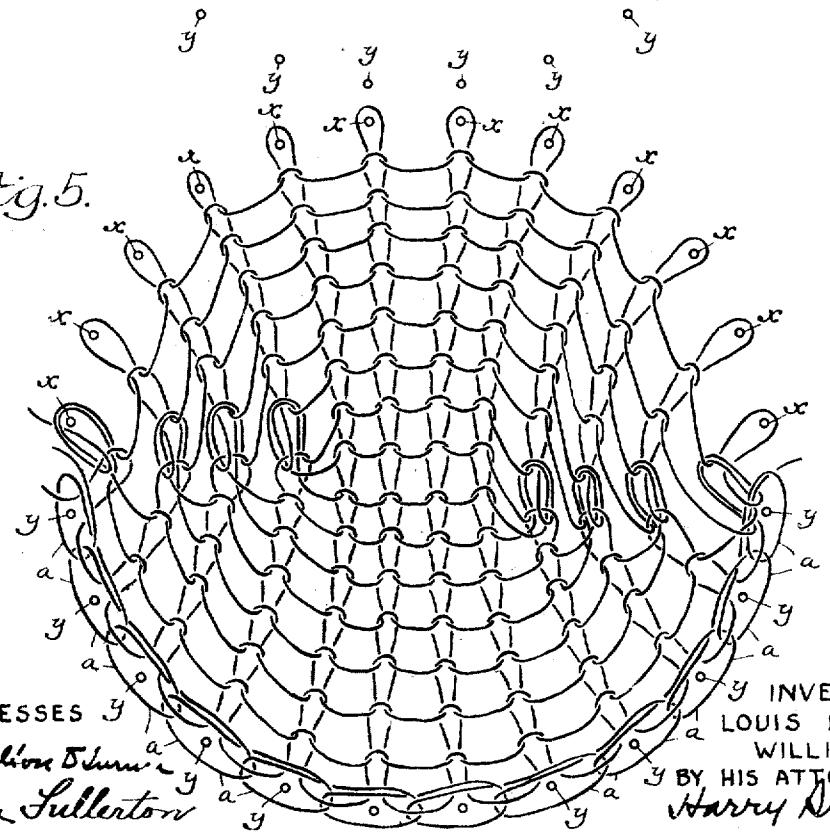


Fig. 5.



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4 SHEETS—SHEET 4.

Fig. 7.

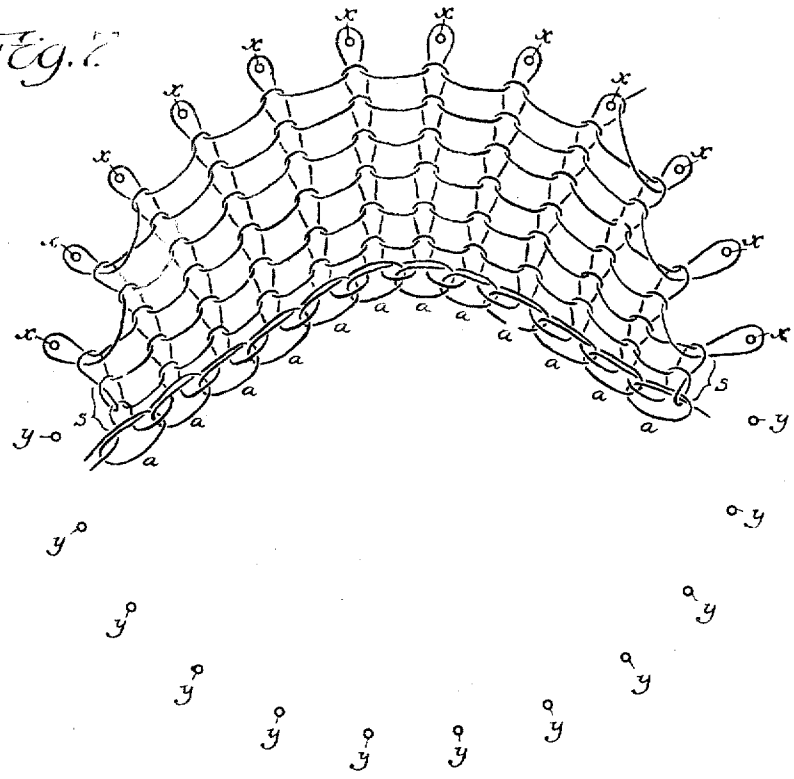


Fig. 6

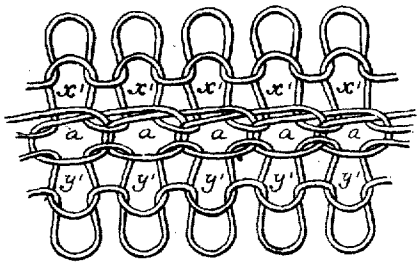
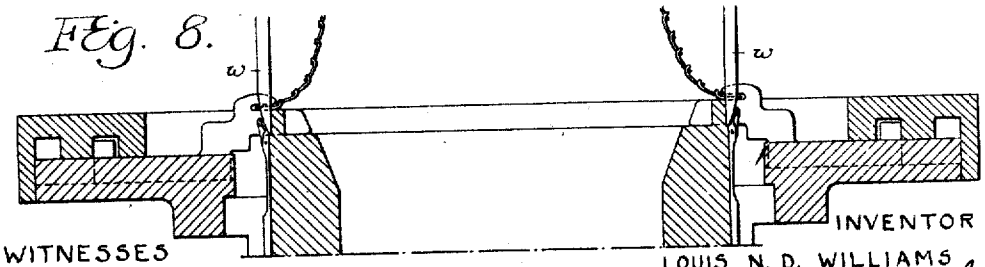


Fig. 8.



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UNITED STATES PATENT OFFICE.

LOUIS N. D. WILLIAMS, OF OGONTZ, PENNSYLVANIA.

HOSIERY.

1,270,083. Specification of Letters Patent. Patented June 18, 1918.

Application filed June 10, 1915. Serial No. 33,246.

To all whom it may concern:

Be it known that I, LOUIS N. D. WILLIAMS, a citizen of the United States, residing in Ogontz, Pennsylvania, have invented certain Improvements in Hosiery, of which the following is a specification.

My invention relates to an article of hosiery (hereinafter, for convenience, termed a "stocking") having what is known as a seamless heel and toe and either a ribbed or a "welted" top, one object of my invention being to render unnecessary the application of the stitches around the mouth of the toe pocket and those around the forward end of the instep portion of the foot web to the "points" of a looping machine, and the subsequent uniting of these stitches by the course of stitches produced by said looping machine.

Another object is to dispense with the application by hand to the points or quills of a looping machine of the stitches around the upper end of the leg web, whether said leg web is united to a ribbed top, as in half hose, or is doubled and has its free edge united to the body of the leg web in order to form a "welt" at the top of a lady's stocking.

These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of a stocking of the ribbed top type made in accordance with my invention;

Fig. 2 is a side view of a stocking of the welt-top type embodying said invention;

Fig. 3 is a diagram illustrating the needles of a circular knitting machine and illustrating also the first step in the production of a stocking in accordance with my invention;

Fig. 4 is a like view illustrating an advance in the production of the toe pocket of the stocking;

Fig. 5 is a like view illustrating conditions immediately preceding the commencement of round-and-round knitting for the production of the foot web;

Fig. 6 is an enlarged view of part of the union between the toe and instep webs;

Fig. 7 is a view similar to Fig. 4, but illustrating another feature of my invention;

Fig. 8 is a vertical sectional view of part of the needle cylinder of a knitting machine and of means for transferring the stitches at the top of the leg web from the needles of said machine onto the points or quills of a looper ring, preparatory to the application thereto of the stitches of the ribbed top, and

Fig. 9 is a like view, illustrating the transfer to the looper points of the stitches at the top of a leg web prepared for forming a welt at the top of said web.

In carrying out my invention I first produce a chain of stitches a equal in number of the number of needles around one half of the needle cylinder, and I then apply said stitches to the needle x of said half of the machine, as shown in Fig. 3.

I then proceed with the production of the toe pocket by reciprocating knitting upon the needles x, the web being first narrowed by dropping out of action needle after needle first at one end of the set and then at the opposite end of the same, but permitting the retired needles to retain their stitches, and then reintroducing these needles in reverse order to form a widened web which is integrally united to the narrowed web first produced.

The toe pocket thus produced has a chain of stitches a around its open mouth, Fig. 4 of the drawing showing the conditions after the first five courses of the toe pocket have been knitted.

When the toe pocket has been completed it presents sufficient slack to permit of the application of the stitches a around the open mouth of the toe pocket to the needles y around the other half of the machine, as shown in Fig. 5. If this slack is not enough to permit of the free application of the stitches a to the needles y, additional slack may be provided by knitting on the needles x one or more free ended selvage courses, before beginning or after completing the formation of the toe pocket. In Fig. 7 such free ended selvage courses are shown at s at the beginning of the toe pocket.

It will be noted that, when a separate course of stitches is, before starting to knit the toe pocket, applied to the needles on which said toe pocket is to be subsequently knitted, said stitches will be interlocked in line with the sinker wales of the knitted web, the full length of each stitch being therefore available for application to the naked needles around the other half of the machine when the knitting of the toe pocket has been completed, consequently such application of these stitches can be effected

more readily and with less likelihood of dropping any of the stitches than when the initial course of stitches of the toe web is thus transferred, as in accordance with the method set forth in the patent of B. F. Shaw, No. 218,458, dated August 12, 1879.

Round-and-round knitting on all of the needles of the machine is then resorted to for the production of the foot web, the first course of stitches at the front end of the instep portion of said foot web being drawn through the stitches *a* in the same manner that the first knitted course of stitches at the beginning of the toe pocket was drawn through the same in starting to knit said toe pocket.

In Fig. 6 of the drawing, *x'* represent stitches of the first knitted course at the beginning of the toe pocket and *y'* represent stitches of the first knitted course at the instep end of the foot web, both of these courses of stitches being drawn through the stitches *a* which thereby serve to unite the toe pocket to the instep end of the foot web, and render unnecessary the usual application by hand to the points of a looping machine first of the stitches around the open end of the toe pocket and then of the stitches around the instep end of the foot web and the subsequent joining of these pairs of stitches by means of a chain of stitches produced by the stitch forming mechanism of the looping machine.

The application by hand, to the points of the looping machine, of the stitches around the toe pocket and instep end of the foot web necessitates the formation of a handling web of considerable width in front of the toe pocket and instep end of the foot web, which handling web must be raveled out before the looping of the stitches is effected, the yarn which formerly composed the handling web having then no value except as waste.

My method of uniting the toe and instep webs of the stocking dispenses with the formation of such handling web and therefore saves the waste incurred thereby as well as the expense of the looping operation.

On the completion of the foot web of the stocking the heel pocket is produced upon the needles *x* and round-and-round knitting is then resumed for the production of the leg web. After the completion of the latter a circular set of transfer points or quills *w* is applied to the needles of the machine (if a ribbed top stocking is being made) and the stitches upon said needles are freed therefrom as shown in Fig. 8. To the transfer points *w* are then applied the stitches of the end course of the ribbed web such as that constituting the top *v* of the stocking shown in Fig. 1, and the series of points each with two stitches upon it, is then applied to an ordinary looping machine and the pairs of stitches are united by a chain of stitches produced by the stitch forming mechanism of said looping machine in the ordinary way.

If a stocking having at the top a turned welt such as shown at *v'* in Fig. 2 is being made, the knitting machine is, as shown in Fig. 9, provided with a set of transfer points or quills *w'* disposed on the inside of the circle of needles, and, at a certain time before the completion of the leg web, (depending upon the depth of the welt) a course of stitches *m* is applied to the needles and the knitting of the leg is then resumed, the course of stitches *m* projecting as shown in Fig. 9. After the completion of the leg web the end course of stitches is transferred to the points *w'*, and the points with the web upon them are removed from the machine so that the course of stitches *m* may be applied to the points and the double stitches then united by a looping machine in the ordinary way.

In Figs. 8 and 9, I have only shown the diametrically opposite needles and transfer points or quills as the showing in the distance of the needles and transfer points or quills around the half circle of the machine would be confusing.

Instead of applying the transfer points or quills *w* or *w'* to the stitches upon the needles of the knitting machine they may, if desired, engage the stitches of a previously produced course of the knitted web, preparatory to the freeing from the needles of the stitches upon them, and although my invention has been designed especially for the use in knitting stockings upon a circular knitting machine it can with equal advantage be adopted in the knitting of stockings upon machines having straight needle beds disposed back to back and corresponding to the opposite halves of a circular knitting machine.

It will be noted on reference to Fig. 6 that the stitches of the toe pocket and of the instep portion of the foot web are drawn through the stitches *a*, consequently the latter stitches lie on the inside of the toe pocket and instep web and are not visible from the outside of the stocking.

I claim:

1. A stocking having a seamless toe pocket at the front end of the foot web, and having, between the top of the toe pocket and the forward end of the instep web, a chain of stitches distinct from those of said toe pocket and instep web and interlocked with the sinker wales of said webs and with each other in line with said sinker wales, through which stitches are drawn the first course of stitches at the beginning of said toe pocket and the first course of stitches at the front end of the instep portion of the foot web.

2. A stocking having a seamless toe pocket at the front end of the foot web, and having, between the top of the toe pocket and the

forward end of the instep web, a course of stitches distinct from those of the toe pocket and instep web and interlocked with the sinker wales of said webs and with each other in line with said sinker wales, said stitches being disposed on the inside of the toe and instep webs and having drawn through them the first course of stitches at the beginning of the toe pocket and the first course of stitches at the front end of the instep portion of the foot web.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

LOUIS N. D. WILLIAMS.

Witnesses:

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HAMILTON D. TURNER.